

Optimizing the geometry of axion haloscopes for gravitational wave searches

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In the presence of electromagnetic fields, gravitational waves (GWs) induce oscillating magnetic fields proportional to the GW amplitude.

That the same is true for an axion implies that a synergy exists between the experimental effort to probe axion dark-matter and the search for high frequency GWs.

We derive selection rules which determine the parametric sensitivity of different detector geometries to axions and GWs for cylindrically symmetric magnetic (or electric) external field configurations.

In particular, we demonstrate that optimizing for the axion signal always eliminates the leading order contribution of the GW signal, and show how small modifications to the pick-up loop can remedy this.

Secondary category for the parallel session (optional)

Cosmology

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